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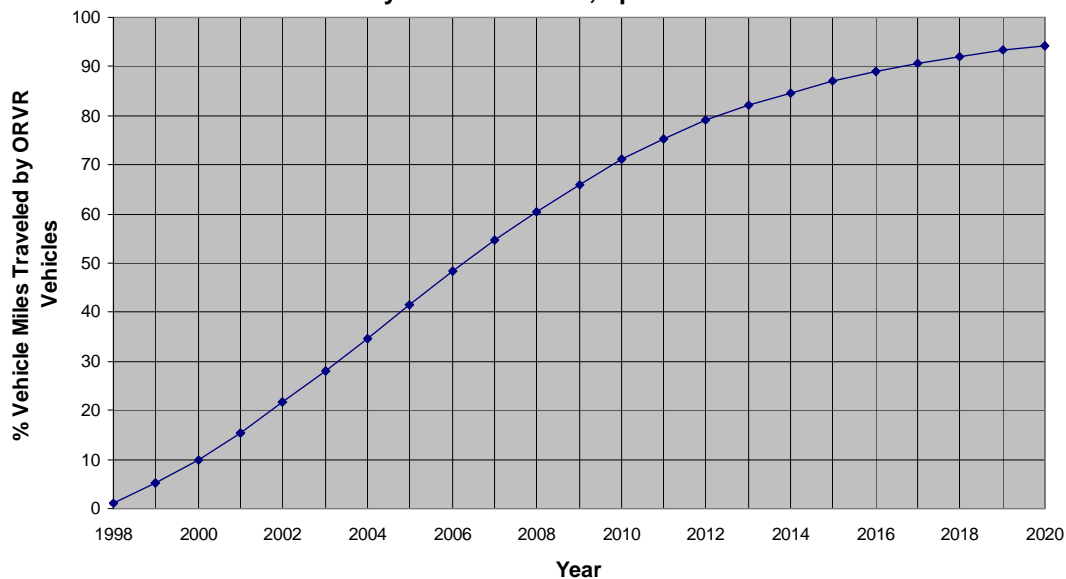
FROM: Frances Cameron
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DATE: July 1, 2008

SUBJECT: MILES TRAVELED BY ORVR VEHICLES IN CALIFORNIA

The percentage of miles traveled in California by vehicles equipped with Onboard Refueling Vapor Recovery (ORVR) systems was projected for 2008 and for future years. The ORVR system captures the gasoline vapors that are displaced when gasoline is dispensed to the vehicle tank and stores those vapors in a canister filled with activated carbon. When the vehicle engine is started, gasoline vapors stored on the carbon are purged and burned in the engine. The ORVR system was first installed on some passenger vehicle models in 1998. As shown in Figure 1, the ORVR vehicle miles will increase to about 94 percent by 2020.

Figure 1: Percentage of vehicle miles traveled (VMT) on California roads by ORVR vehicles, updated in 2008



The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

The data for Figure 1 is provided in Table 1. In 2008, the vehicle miles traveled (VMT) for each of the on-road vehicle classifications that are mandated to have ORVR systems, was projected with ARB's Emission Factors (EMFAC) 2007 model, version 2.3, released November 1, 2006. These vehicle classifications include passenger cars, light duty trucks, medium duty vehicles, and light heavy duty trucks.

**Table 1: Percent of miles traveled
by ORVR vehicles on California roads**

Calendar Year	ORVR vehicle miles traveled (VMT) as a percent of total VMT
1998	1
1999	5
2000	10
2001	15
2002	22
2003	28
2004	35
2005	41
2006	48
2007	55
2008	60
2009	66
2010	71
2011	75
2012	79
2013	82
2014	85
2015	87
2016	89
2017	91
2018	92
2019	93
2020	94

The data and assumptions used in calculating the percent of miles traveled by ORVR vehicles on California roads are outlined below:

1. The percentage of ORVR vehicle miles traveled on California roads by vehicle model year was assumed to reflect the federally mandated phase-in schedule for ORVR vehicles. Table 2 is that phase-in schedule for each vehicle category. The

California Code of Regulations (CCR)¹ includes the same phase-in schedule for passenger cars, light duty trucks, and medium duty vehicles with a gross vehicle weight rating (GVWR) \leq 8,500 lbs, as does federal law. However, only federal law requires ORVR for vehicles with a GVWR between 8,501 and 10,000 lbs.

Table 2: Federally mandated phase-in schedule for ORVR vehicles

Vehicle Category	Non-ORVR Vehicles	40% ORVR	80% ORVR	100% ORVR
Passenger Cars	\leq 1997	1998	1999	\geq 2000
Light Duty Trucks, \leq 6000 lbs. gross vehicle weight rating (GVWR)	\leq 2000	2001	2002	\geq 2003
Medium Duty Vehicles, Light Heavy Duty Trucks, 6000 – 10,000 lbs GVWR	\leq 2003	2004	2005	\geq 2006

Source: U.S. Code of Federal Regulations (CFR), Title 40, Part 86

- The fraction of ORVR vehicle miles traveled on California roads was determined as a percentage of the miles traveled by all on-road vehicles for which Phase II vapor recovery systems are effective to reduce emissions. State law requires that all on-road gasoline-powered vehicles with the exception of motorcycles be equipped with a uniformly configured fillpipe² so that refueling vapors are effectively captured by the Phase II vapor recovery systems installed at gasoline dispensing facilities. Heavy duty vehicles that have a GVWR greater than 10,000 lbs are not required to be equipped with ORVR, but have uniformly configured fillpipes so that refueling vapors are controlled by Phase II vapor recovery systems. In 2008, the VMT for all gasoline-powered on-road vehicles with fillpipes configured for Phase II vapor recovery was distributed among the following vehicle categories:

Passenger Cars	52%
Light Duty Trucks	35 %
Medium Duty and Light Heavy Duty Vehicles with GVWR \leq 10,000 lbs	12 %
Non-ORVR Heavy Duty Vehicles with GVWR $>$ 10,000 lbs	1 %

- ORVR penetration in 2008 was calculated for each ORVR vehicle category and model year by applying the fraction of ORVR penetration by vehicle category and model year in Table 2 to the fraction of the total vehicle miles traveled for each

¹ California Code of Regulations (CCR), Title 13, Section 1978.

² California Code of Regulations (CCR), Title 13, Section 2235.

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vehicle category and model year in 2008. The profile of ORVR vehicle miles traveled for each vehicle category and model year in 2008 was then applied to forecast ORVR penetration for future years and to back cast ORVR penetration for past years. This forecasting method does not include any projected changes in buying and driving habits, nor does it include any change in the projected impact of programs to remove older vehicles or encourage use of electric, hybrid, or alternate fuel vehicles.

If you have questions regarding this analysis or need further information, please contact me via email at fcameron@arb.ca.gov or (916) 445-9314.